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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,265	01/14/2004	B. Ryland Wiggs	50081/40001US	4898
57726 7590 11/27/2009 MILLER, MATTHIAS & HULL ONE NORTH FRANKLIN STREET SUITE 2350 CHICAGO, IL 60606				
EXAMINER				
ALL, MOHAMMAD M				
ART UNIT		PAPER NUMBER		
3744				
NOTIFICATION DATE		DELIVERY MODE		
11/27/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

lrudaitis@MILLERMATTHIASHULL.COM

Office Action Summary

Application No.

10/757,265

Applicant(s)

WIGGS, B. RYLAND

Examiner

MOHAMMAD M. ALI

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 68-73 and 79-90 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 85 and 87 is/are allowed.
- 6) ☒ Claim(s) 68-70, 73, 79-81, 84, 86 and 88-90 is/are rejected.
- 7) ☒ Claim(s) 71, 72, 82 and 83 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 68 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiggs et al in view of Shook (3,872,682). Wiggs et al discloses a geothermal heat pump heating/cooling heat exchanger (See column 1, lines 9-10) comprising a providing an interior heat exchanger (5); providing an exterior subterranean heat exchanger (1); charging the system with a refrigerant (See refrigerant flow direction (12, which indicates the system has been charges with refrigerant). Wiggs et al disclose the invention substantially as claimed as stated above except range of the head pressure of 350 to 405 psi and suction pressure in the range of 80 to 160 psi. Shook teaches the use of head pressure in the range of 5 atmosphere (73.5 psia) to 30 atmosphere (441 psia) to 700 psia head (See column 6, lines 7-21); Shook further teaches the use of suction pressure in the range of 5 atmosphere (73.5 psia) to 300 psia in a vapor compression refrigeration system for achieving a better cooling effect with an environmental friendly refrigerant.. Apart

from the above an ordinary individual skilled in the art is well known to the suction and head pressure of individual refrigerant. Characteristic of each type of refrigerant can be found in a refrigeration chart. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the refrigeration system of Wiggs et al in view of Shook such that desired head pressure within the range of 73.5 psi to 700 psi and desired suction pressure within the range of 73.5 psia to 300 psia could be provided in order to achieve an efficient and environmental friendly refrigerant circuit. Regarding cooling mode or heating mode, an ordinary individual skilled in the art is well known the characteristics of a cooling mode and a heating mode. Therefore, whatever may be the mode for a head pressure or suction pressure it is well within the knowledge of an individual skilled in the art.

Claims, 69, 80, 89 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiggs et al (5,671,608) in view of Shook as applied to claims 68 and 79 above and further in view of Aoyagi et al., (6,390,183). Wiggs et al, and Shook disclose a direct expansion geothermal heat pump except R410A refrigerant. See Abstract. Aoyagi et al teach the use of R410 refrigerant in a heat exchanger for the purpose of enhancing heat transfer coefficient and to protect ozone layer. See column 6, lines 46-61, column 7, lines 29-45 and column 16, lines 15-39. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the direct expansion geothermal heat pump of Wiggs et al, Shook and further in view of Aoyagi et al such that R410 refrigerant could be provided in order to run a direct expansion heat pump system in an safe environmental way.

Claims 70 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiggs et al (5,671,608) in view of Shook, as applied to claim 68 and 79 above and further in view of Suzuki et al. Wiggs et al in view of Parker and Richardson disclose the invention substantially as claimed as stated above. However, Wiggs et al in view of Shook, do not disclose polyolester oils. Suzuki et al., teach the use of polyolester oil as lubricating oil in a climate control system for the purpose of running of the climate control system. See column 11, lines 14-28. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the direct expansion geothermal heat pump of Wiggs et al Parker and Richardson in view and further in view of Suzuki et al such that polyolester oil could be provided in order to run a direct expansion heat pump system with carbon dioxide refrigerant.

Claims 73, 84, 86 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiggs et al (5,671,608) in view of Shook, as applied to claim 68 and 79 above and further in view of Johannsen (US 3,421,337). Wiggs et al in view of Shook disclose the invention substantially as claimed as stated above. However, Wiggs et al in view of Shook do not disclose superheat condition in the range of 10 to 25 degree F. Suzuki Johannsen teaches the use of superheat condition to be maintained at 12 degree F in a refrigeration circuit for the purpose of efficient running of the circuit. See column 4, lines 5-8.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the direct expansion geothermal heat pump of Wiggs et al, Shook in view and further in view of Johannsen such that a super heat range of 12 degree F could be provided in order to run the refrigerant circuit in an efficient manner.

Allowable Subject Matter

Claims 85 and 87 are allowed.

Claims 71, 72, 82, and 83 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

and are persuasive. Applicant's arguments with respect to claim 68-73 and 79-90 under 103 have been considered but are moot in view of the new ground(s) of rejection.

The Applicant argues that each of the independent claims 68 and 79 requires a direct expansion geothermal heat exchange system having heating mode and cooling mode of approximately 305-405 psi cooling mode heat pressure and 80-160 psi head pressure at heating mode. No combination of Wiggs, Parker and Richardson teaches or suggests all of this limitation. The Examiner disagrees. Wiggs discloses a subsurface vapor compression heat pump system. Parker discloses a vapor compression heat exchange system with 400 psi heat pressure (See column 1, lines 26-30) in a vapor compression refrigeration system and Richardson teaches the use of 90 psi suction pressure (See example 2, column 8, lines 3-4). Therefore the above argument of the applicant that no combination of Wiggs, Parker and Richardson teaches or suggests all of this limitations of claims 68 and 79 is not correct. The Applicant further argue that Parker is irrelevant to subsurface heat exchanges.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOHAMMAD M. ALI whose telephone number is (571)272-4806. The examiner can normally be reached on maxiflex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4808. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mohammad M Ali/
Primary Examiner, Art Unit 3744